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Waste, Water, & Energy

Spring 2012

**Description**: In Kindergarten science, students are introduced to many types of animals in addition to exploring and comparing their basic needs and structures. By the time they reach first grade, the students understand the basic elements that will help them distinguish between living and non-living things, they can identify—and in some cases, explain—the function of certain animals’ body structures, and they are developing a rudimentary understanding of basic plant and animal life cycles.

In this lesson, students will be re-introduced to a familiar animal from Kindergarten: the red wiggler worm. Red wigglers are used frequently in composting, as they aid in the decomposition process, and ultimately make it faster than microbial and bacterial decomposition alone. Students will create their own worm bins and predict what materials a red wiggler may consume. Follow-up lessons will evaluate their predictions and create ways in which our school’s food waste can be more efficiently managed and hopefully, minimized. The worm bins themselves can be used indefinitely.

**Grade Level**:

First

**Topic**:

If Worms Eat Our Garbage, Why Are We Throwing So Much Away?

**Student standards**:

LE 1.1a, LE 1.2a, LE3.1a, LE 4.1a

Inquiry Skills Addressed: Predicting, Observing, Communicating

Process Skills Addressed: i, iii, iv, xiii

**Teacher Standards**:

Danielson:

3c. Engaging Students in Learning

3d. Using Assessment in Instruction

**Time**:

Initial lesson: 45 minutes. Follow up lessons: 2-3 weeks.

**Objectives**:

* Students will be able to identify what materials a red wiggler may consume and may not.
* Students will build a worm bin to observe over the weeks that follow the lesson.
* Students will make predictions about what they think the red wigglers will consume and what they may not.

**Materials**:

\*The day before this lesson, ask for a few student leftovers from the lunch room and gather a few unusual objects (cloth, paper, rubber bands, crayon, egg shells, pencil, etc).

\*Red wigglers can be purchased at most pet supply stores.

\*5-qt, opaque bins, preferably with lids that have small perforations for each group.

\*Spray bottles with water

\*Paper towel

**Procedure/Methods**:

Introduction: 10 minutes

*Boys and girls, we’ve had the chance to see many types of living things in the past, but today I want us to explore an animal that is more helpful to us than you may know! We are going to watch a quick video called “Soil”, and I want you to see if you can figure out what animal I am talking about.*

Play the video, “Soil” found at <http://www.brainpopjr.com/science/land/soil/preview.weml>

If you do not have an account with brainpop, a similar short story (“Diary of a Worm” by Doreen Cronin, or “Winnie Finn, Worm Farmer” by Carol Brendler) would be a suitable replacement with a slightly adapted introduction.

After the video ask students to guess which animal will be investigated during this lesson. Once they have guessed “Worms!” continue:

*We learned in Kindergarten that worms eat certain things—even garbage!—but I want us to find out for ourselves. What sorts of things do you think worms can eat?*

Solicit student answers and chart results. If needed, offer suggestions. Example:

*Do you think worms eat pizza?*

*Might our worms love a juicy cheeseburger?*

Lesson: 20 minutes

*I think these predictions are fantastic! Today, we are going to build worm bins to observe and compare exactly what our worms will eat and what they will not eat. I asked Ms. Torres to give me some of your leftovers from lunch yesterday and I saved them to add to our worm bins. I have lots of pieces of lettuce, some tomatoes, an apple that I have cut up, a banana peel, a piece of grilled chicken, and even a few cookies! Because I was really curious to know if worms would eat anything we give them, I brought some other things with me from home: cloth, paper, rubber bands, crayons, egg shells, and pencils.*

Inevitably, students will ask if they can add other items to their worm bins. Encourage this exploration, but remind students to ask for permission before bringing food from the cafeteria or from home.

*Ms. Brathwaite* (teaching assistant) *and I will be passing out all of those objects to your group as well as a bin with some torn up paper towel and a spray bottle filled with water. Before we add any objects or worms, each person needs to spray the paper towel in your bin three times. This small amount of moisture will help the worms.* Allow students time to do this once materials are passed out. Remind them to take turns and share if necessary.

*Each person in your group may choose one thing from yesterday’s lunch and one thing I brought from home to put into your bin.* Allow students time to do this once materials are passed out, scaffold comments for students based on their answers to questions:

*That looks interesting. Do you think the worms will eat it? Why do you think so?*

*If we look back in our worm bins in a few weeks, what do you think might be left behind?*

*Is there a way we could measure how much the worms eat?*

Once bin assembly is complete, continue:

*Now that our lovely worm homes are ready, we need to add the worms! Each group will be getting a small* (1/4 liter) *container of red wiggler worms and a lid to put on top of your bin once the worms are inside their new homes.* Assist students with this part, so as not to harm the worms.

Conclusion: 10 minutes

*Our worms will eat, eat, eat some of the things we put into our worm bins, but not everything. We will check our worm bins every week to look for any changes. We will also write and draw about what we observe. To finish up today, I would like you to draw a picture of your finished worm bins with label. Please include a one-sentence prediction about what you think might happen to the worms and to the things we put in our bins as well.*

**Assessment/Rubric:**

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| --- | --- | --- | --- |
| *Rubric (for children to self-assess)* | ☺ | 😐 | ☹ |
| **Science Journal** | I recorded my observations with pictures and a one-sentence prediction.  I labeled my pictures. | I recorded my observations with some pictures and some words. | I did not record any of my observations. |
| **Class Discussion** | I listened to my friends. I shared my ideas, connections, and observations. | I did not participate in all of my discussions. I was sometimes a respectful listener. | I did not participate in class. I was not a respectful listener. |
| **Effort** | I tried my best. | I tried my best sometimes. | I did not try my best. |

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| *Rubric (for the teacher to assess the students)* | **3**  Secure in mastering standards and learning objective. | **2**  Developing mastery of standards and learning objectives. | **1**  Beginning comprehension of standards and learning objectives. |
| **Science Journal** | Student created diagram to record observations. Diagrams are labeled and written predictions are clear. Most words are spelled correctly or appropriate letter sounds are used. | Student recorded observations with some pictures and some words. | Student did not record any observations with pictures or words. |
| **Class Discussion** | Student listened to classmates and made connections to what their classmates said. Student used appropriate science vocabulary words during discussion. | Student mostly listened to classmates. Student participated in discussion to a minimum degree. | Student did not pay attention to other children. Student did not participate in discussion. |
| **Effort** | It was evident that the student put effort into the activity and discussion. | It was somewhat evident that the student put effort into the activity and discussion. | It was not evident that the student put effort into the activity and discussion. |